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New method to study the repellent, irritant and toxic effects on *Anopheles gambiae*. Application on 20 essential oils

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Laboratory and field studies showed that repellent and irritant actions of common public health insecticides reduce the man-vector contact and so interrupt the disease transmission particularly when use with long lasting treated bednets. However resistance in mosquitoe populations bring up the issue of finding alternative to these insecticides. The objective of this study was to evaluate the repellent, irritant and toxic effects of 20 essential oils on *Anopheles gambiae* adults in laboratory. A high-troughput screening system was previously described to characterize repellent, irritant and toxicant chemical actions on *Aedes* spp. This system was adapted to test essential oils on *An*. *gambiae*. Twenty essentials oils were tested on *An*. *gambiae* at three concentrations (0.01%, 0.1% and 1%) with 3 replications of 20 adult mosquitoes. Results showed essential oils could have irritant, repellent, or toxic effects on *An*. *gambiae*. But data also indicated that behavioral responses to the three effects appeared independent so we could expect that the repellent mechanism may be different than the irritant and than the toxic ones. However the behavioral response of *An*. *gambiae* was dose-dependent.